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EFFECT OF OUTDOOR ACTIVITIES IN MYOPIA

Optometry

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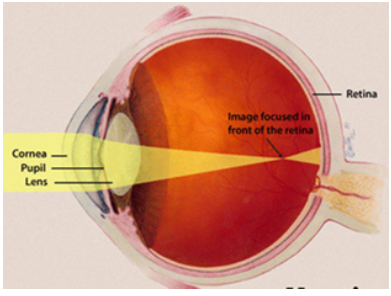
ABSTRACT

Due to high prevalence myopia has gained importance in epidemiological studies. Children with early onset are at particular risk of complications related to myopia, as progression over time might end in high myopia and myopic degeneration. Both genetic and environmental factors play a task within the increasing prevalence of myopia. The aim of this study is to review the present literature on epidemiology and risk factors for myopia in class children (aged 6–19 years) round the world. PubMed and Medline were looked for the subsequent. English articles published between Jan 2013 and Mar 2019 were included within the study. Studies were critically reviewed for study methodology and robustness of knowledge. Eighty studies were included during this literature review. Myopia prevalence remains higher in Asia (60%) compared with Europe (40%) using cycloplegic refraction examinations. Studies reporting on non-cycloplegic measurements show exceptionally high myopia prevalence rates in class children. In recent studies, risk factors for myopia in schoolchildren included low outdoor time and near work, dim light exposure, the utilization of LED lamps for homework, low sleeping hours, reading distance but 25 cm and living in an urban environment.

KEYWORDS



INTRODUCTION:

It is now widely accepted that the event of myopia is subject to the influences of genetic and environmental factors, although some researchers have suggested that environmental exposures are the main causes of current differences in myopia prevalence. Evidence supporting the importance of hereditary factors has included twin studies, which report higher correlations of refraction in monozygotic than dizygotic twins, whereas factors like higher levels of education may underscore the widespread trends of accelerating myopia among the younger cohorts in adult samples. In children, recent studies have reported significant associations between childhood and parental myopia. Geographic location can also be important for childhood myopia, with higher myopia prevalence reported in urban compared with rural areas. The impact of urbanization, however, has been specifically reported in just one retrospective study. Studies that control for differences in levels of near work and outdoor activity, also as parental myopia, are likely to supply a far better understanding of subtle impacts from differences within an urban environment. During this study, we sought to guage the impact of urbanization by examining the association of childhood myopia with factors like the world of residence, sort of residential housing, and housing density, during a stratified sample of Australian school children living in several urban environments but attending an equivalent schools.

Study

The study was approved by the Institutional ethics panel of our hospital and followed the tenets of the Declaration of Helsinki for biomedical research. Permission for conducting the study within the selected schools was taken from the District Education Authority. A form in English and therefore the local vernacular language which is Hindi was sent to all or any the oldsters to sign for providing the consent for the procedure. If the consent form wasn't returned or the oldsters had any doubts regarding the procedure, they were contacted by telephone and every one concerns regarding the study were addressed. If the oldsters still didn't return the signed consent form, the kid wasn't enrolled within the study.

The previously compiled list of all the enrolled children within the school in classes 1 to 10 was used with the Unique number (U.I.D. Number) that was given within the first round. As most of the youngsters were within the subsequent higher class, the rolls were compared with the roll list of the next class and therefore the U.I.D. numbers were matched to make sure that the small print of an equivalent child are recorded within the evaluation sheet. the assistance of the respective class teacher was taken to make sure correct identification of every child. The list of youngsters that had left school over the previous 1 year was matched with the list of enrolled children and that they were faraway from the list for examination. Wherever possible the teacher who had participated within the study initially within the first year was asked to help within the follow up re-examination of the youngsters. Prior participation of teachers within the original study had made them conversant in the examination process and therefore the study protocol which helped to attenuate time spent in training of the teachers and explaining the method of examination. the foremost important function of the teachers was to make sure correct identification of the kid with the Unique number given to the kid within the first round.

Assessment of Near Work and Outdoor Activity

All subjects completed a near-work questionnaire developed and validated, with the assistance of their parents, were instructed to fill within the number of hours spent on differing types of near work and outdoor activities listed within the questionnaire to the closest half hour. Information regarding the working distance for near activities was also obtained. Further information regarding the amount of schooldays, holidays, and academic-topic examination sessions was wont to calculate the weighted average of near-work activity for the year, which was then converted into average hours of near work per day. Nearwork activity was then calculated in terms of diopter-hours by multiplying the typical number of hours of near work per day by the reciprocal of the working distance.

Assessment of outside activity decided from questions that included outdoor sports (e.g., cricket) and leisure activities (e.g., cycling). Participants were asked to fill within the time spent per day on these activities, which then gave a measure of the entire outdoor activity per day. Total outdoor activity per day was defined because the sum of outside sports and outdoor leisure activity.

Statistical Analysis

Data were analyzed using SPSS Version 14.0. Refractive error was taken because the mean spherical equivalent refraction. A two-way, between-groups multivariate ANOVA was performed, with refractive error and axial length as continuous dependent variables; near work and outdoor activities were taken as categorical independent variables. Multiple comparisons between groups for main effects and interaction

were performed using independent samples t-test and oneway ANOVA, respectively. For comparing the most effect of near-work activity, subjects were divided into two groups, namely "More Near Work: >18 Dh" and "Less Near Work: ≤18 Dh". For comparing the most effect of your time spent outdoors, subjects were divided into two groups, namely "More Outdoor Time: >1 hour" and "Less Outdoor Time: ≤1 hour."

Interaction Between Outdoor Time and Near-Work Activity
The interaction between near-work activity and time spent outdoors was significant for both refractive error (MANOVA F1,147 = 6.58, p < 0.0001) and axial length (MANOVA F1,147 = 3.45, p = 0.018).Subjects with more near work and fewer time spent outdoors were more myopic than those that did less near work and spent longer outdoors (p = 0.001). within the less-outdoor-time groups, subjects with more near work had significantly more myopia than those with less near work (p = 0.009). Among the moreoutdoor-time groups, subjects who spent longer on near work had a significantly more myopic SER than those with less near work (p = 0.001). within the more-near-work groups, subjects who spent less time outdoors were more myopic than those with longer spent outdoors (p = 0.001). Subjects who did more near work and spent less time outdoors had a significantly longer axial length than those with less near work and longer spent outdoors (p = 0.01). In the less-near-work groups, subjects who spent less time outdoors had a significantly longer axial length than those that spent longer outdoors (p = 0.014). Binary logistic regression model (Table 3) showed that children with a positive case history of myopia were about 11 times more likely to be myopic compared to children who didn't have a myopic parent or sibling. Children who did more near work and spent less time outdoors were 15 times more likely to be myopic, compared to children who combined less near work with more outdoor time.

Main Effect – Outdoor Time
There was a statistically significant effect of outside time on both refractive error (MANOVA F1,149 = 5.07, p = 0.026) and axial length (MANOVA F1,149 = 7.91, p = 0.006). Children who spent less time outdoors had significantly more myopic refractive error and longer axial length than those that spent longer outdoors.

Main Effect – Near Work Activity
Near work activity had a big effect on refractive error (MANOVA F1,149 = 4.88, p = 0.029), but not on axial length (MANOVA F1,149 = 1.74, p = 0.19). Children with more near-work activity had a significantly more myopic refractive error than those with less near work; axial length wasn't significantly different between the 2 groups.

RESULTS
A total number of 500 children were screened with mean age of 11.6±2.2 years range: 5 years to 15 years). Prevalence of myopia was 15.3% with only 335 children wearing appropriate prescribed spectacles. Mean myopic spherical error was -1.26±1.1diopteric power. Prevalence of myopia was higher in private schools compared to government schools.

There was a positive association of myopia with children of outdoor activity vs. indoor activity. Positive association of presence of myopia was observed with children studying > 6 hours per day (p<0.001), watching television >4 hours/day (p < 0.001) and with playing computer/video/mobile games (p<0.001). An inverse association with outdoor activities/ playing was observed with children playing >3 hours in a day.

Outdoor play has been recently observed to be protective for myopia and our results showed that a greater proportion of children without myopia (47.4%) spend >14 hours per week outdoors compared to those with myopia (5.0%). Therefore playing outdoors has a significant inverse association with myopia (p<0.001).

DISCUSSION
Our study shows that myopia is a crucial health issue in India with high incidence and progression. In India, the varsity Vision Screening Programme, a part of the National Programme for Control of Blindness, is a crucial strategy for controlling visual defect thanks to refractive error. However, no guidelines exist for the frequency of screening which is typically done after 3–4 years or as per the supply of resources which vary in several parts of the country. supported these rates we recommend that faculty screening should be conducted annually which the prevalence of myopia during this population is probably going to point out a marked increase which may have major implications to the financial cost of correcting these refractive errors. it's evident that there's a progressive change within the lifestyle of urban children in India with increased tendency to stay indoors and have interaction in technological devices for Entertainment. It's therefore imperative that some policy changes be implemented within the school curriculum in order that increase in outdoor activity could also be incorporated within the daily timetable. this might not only help to scale back the magnitude of myopia but also may help within the general health and well-being of the growing child.

supported this meta-analysis, the solution is obvious that outdoor time features a positive effect on myopia control. Specifically, compared with the control group, there was a mean of 0.15 (95% CI 0.06–0.23) D benefit on refractive error. The change of refractive error of the outdoor group was slower than that of the control group by 0.17 (95% CI 0.16–0.18) D. The change of axial length of the control group was faster than that of the outdoor group by –0.03 (95% CI –0.03 to –0.03) mm. there have been fewer new myopia cases within the outdoor group, and therefore the pooled RR was 0.76 (95% CI 0.67–0.87).

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